

WHAT IS CLAIMED IS:

1. A three-dimensional model search method in which a feature value of a three-dimensional model is used to search for a similar three-dimensional model,
5 comprising:

a search object image production step of producing a plurality of two-dimensional images obtained by observing the three-dimensional model as an object of search from points of view different from one another;

10 a first feature value extraction step of extracting the respective feature values of the two-dimensional images from the plurality of two-dimensional images produced in the search object image production step;

15 a search key input step of inputting a two-dimensional image as a search key;

a second feature value extraction step of extracting the feature value from the two-dimensional image as the search key inputted in the search key
20 input step; and

a similarity search step of using the feature values extracted in the first and second feature value extraction steps to carry out similarity search, and outputting a three-dimensional model which is similar
25 to the search key.

2. The three-dimensional model search method according to claim 1, wherein the two-dimensional image

produced in the search object image production step is a two-dimensional projection image and/or a sectional image which corresponds to the three-dimensional model.

3. The three-dimensional model search method
5 according to claim 2, wherein the two-dimensional projection image and/or the sectional image includes texture information.

4. The three-dimensional model search method according to claim 1, further comprising: a storage
10 step of storing the three-dimensional model as the object of the search, the feature value extracted in the first feature value extraction step, and correspondence information indicating correspondence between the three-dimensional model and the feature
15 value extracted in the first feature value extraction step.

5. The three-dimensional model search method according to claim 1, further comprising:

a three-dimensional feature value extraction step
20 of extracting a three-dimensional feature value from the three-dimensional model as the object of the search; and

a second similarity search step of using
the three-dimensional feature value of the three-
25 dimensional model outputted as a search result of the similarity search step as the search key to search the three-dimensional feature value of

each three-dimensional model extracted in the
three-dimensional feature value extraction step, and
outputting a three-dimensional model which has
the three-dimensional feature value similar to the
5 search key.

6. A three-dimensional model search apparatus
which uses a feature value of a three-dimensional model
to search for a similar three-dimensional model,
comprising:

10 a search object image production section which
produces a plurality of two-dimensional images obtained
by observing the three-dimensional model as an object
of search from points of view different from one
another;

15 a first feature value extraction section which
extracts the respective feature values of the
two-dimensional images from the plurality of
two-dimensional images produced by the search object
image production section;

20 a search key input section which inputs
a two-dimensional image as a search key;

a second feature value extraction section which
extracts the feature value from the two-dimensional
image as the search key inputted via the search key
25 input section; and

a similarity search section which uses the feature
values extracted by the first and second feature value

extraction sections to carry out similarity search and which outputs a three-dimensional model similar to the search key.

5 7. The three-dimensional model search apparatus according to claim 6, wherein the two-dimensional image produced in the search object image production section is a two-dimensional projection image and/or a sectional image which corresponds to the three-dimensional model.

10 8. The three-dimensional model search apparatus according to claim 7, wherein the two-dimensional projection image and/or the sectional image includes texture information.

15 9. The three-dimensional model search apparatus according to claim 6, further comprising: a storage section which stores the three-dimensional model as the object of the search, the feature value extracted in the first feature value extraction section, and correspondence information indicating correspondence
20 between the three-dimensional model and the feature value extracted in the first feature value extraction section.

 10. The three-dimensional model search apparatus according to claim 6, further comprising:

25 a three-dimensional feature value extraction section which extracts a three-dimensional feature value from the three-dimensional model as the object of

the search; and

5 a second similarity search section which uses
the three-dimensional feature value of the three-
dimensional model outputted as the search result in the
similarity search section as the search key to search
the three-dimensional feature value of each three-
dimensional model extracted in the three-dimensional
feature value extraction section and which outputs the
three-dimensional model having the three-dimensional
10 feature value similar to the search key.

11. A three-dimensional model search program which
allows a computer to calculate a feature value of
a three-dimensional model and to search for a similar
three-dimensional model using the feature value and
15 which allows the computer to realize:

20 a search object image production function of
producing a plurality of two-dimensional images
obtained by observing the three-dimensional model as an
object of search from points of view different from one
another;

25 a first feature value extraction function of
extracting the respective feature values of the
two-dimensional images from the plurality of
two-dimensional images produced by the search object
image production function;

 a search key input function of inputting
a two-dimensional image as a search key;

a second feature value extraction function of extracting the feature value from the two-dimensional image as the search key inputted by the search key input function; and

5 a similarity search function of using the feature values extracted by the first and second feature value extraction functions to carry out similarity search, and outputting a three-dimensional model similar to the search key.

10 12. A three-dimensional model search system which calculates a feature value of a three-dimensional model and which uses this feature value to search for a similar three-dimensional model, comprising:

 a first feature value extraction section
15 which extracts the respective feature values of two-dimensional images from a plurality of two-dimensional images obtained by observing the three-dimensional model as an object of search from points of view different from one another;

20 a second feature value extraction section which receives a two-dimensional image as a search key transmitted from a client via a network to extract a feature value of the two-dimensional image; and

 a similarity search section which uses the feature
25 values extracted in the first and second feature value extraction sections to carry out similarity search and which transmits information about a three-dimensional

model similar to the search key to the client via the network.

13. A three-dimensional model search apparatus which uses a feature value of a three-dimensional model to search for a similar three-dimensional model, comprising:

search object image production means for producing a plurality of two-dimensional images obtained by observing the three-dimensional model as an object of search from points of view different from one another;

first feature value extraction means for extracting the respective feature values of the two-dimensional images from the plurality of two-dimensional images produced by the search object image production means;

search key input means for inputting a two-dimensional image as a search key;

second feature value extraction means for extracting the feature value from the two-dimensional image as the search key inputted by the search key input means; and

similarity search means for using the feature values extracted by the first and second feature value extraction means to carry out similarity search, and outputting a three-dimensional model which is similar to the search key.